Putting Research to Work

RD&T E-Newsletter, November 2003

Technical information for state DOT highway professionals

Prepared by CTC & Associates LLC

WisDOT RD&T Home

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Research World

TRB 83rd Annual Meeting January 11-15, 2004

The Transportation Research Board meeting draws 9,000 professionals from around the world to participate in 500 sessions covering all transportation modes. This year's themes are:

- Renewing the transportation infrastructure
- Security: Measures that can make a real difference
- Funding: Reauthorization and beyond

Register before November 30 to take advantage of lower fees. See information on TRB's Web site at: http://www4.nationalacademies.org/trb/annual.nsf.

New Zealand Establishes Call Center for Road Information

Transit New Zealand is implementing a national call center system to provide enhanced access to information on the road network. Exor Corporation was selected to develop a Traffic and Road Information Database to support the logging and reporting of road events and conditions using modules from the Exor road asset management suite of products. Link to news release: http://www.marketwire.com/mw/release_html_b1?release_id=58989. Courtesy of the Transportation Communications Newsletter.

Warm-Mix Asphalt A Cooler European Alternative

The National Asphalt Pavement Association drew our attention to an article in the September issue of Roads and Bridges, "Cooled and Ready to Serve?" The piece by Margaret Blain Cervarich describes European use of warm-mix asphalt, which is up to 100 degrees cooler than most hot-mix, via certain foam mixes, synthetic zeolite additives, or organic additives. The mixes reduce energy and material needs, as well as fume output. See http://www.roadsbridges.com/Im.cfm/rb090315.

Slurry Surface Specs Released In Australia

The recent *Austroads*, a transportation agency newsletter from Down Under, announced publication of specifications for bituminous slurry, a thinner, quieter and more skid-resistant alternative to spray sealants. To download the free "Guidelines and Specification for Bituminous Slurry Surfacing," click on "Publications database" at http://www.austroads.com.au/publications.html and type "T26" in the "AP Number" field of the Publication Search screen.

Medical Standards For Australian Drivers

Each year, more than 1,700 drivers are killed and 23,000 seriously injured on Australian roads. Transportation officials have released new medical standards for licensing drivers of private and commercial vehicles, maintaining that driver health is an important consideration in road safety. Link to the article in the Austroads E-newsletter: http://www.austroads.com.au/generalnewscurrent.html#news-aftd

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Designing for the Future

Planning Information at Your Fingertips

FHWA recently launched the Transportation Planning Capacity Building Web site (www.planning.dot.gov), a clearinghouse for transportation planning information. It features information on planning-related legislation, training courses, technical resources, and case studies. Users can link to a report on statewide transportation plans, a travel forecasting guidebook, and summaries of best practices. Courtesy of *R&T Transporter:* http://www.tfhrc.gov/trnsptr/sep03/index.htm#new.

FHWA Offers Geotechnical Design Aids to States

Distribution of Foundation Stress and Settlement Analysis software to state DOTs was one topic of discussion at a recent meeting of FHWA geotechnical specialists. The software helps designers evaluate stress and deformation associated with highway projects built on weak foundations. Other meeting topics included state programs in geotechnical engineering and recent geotechnical engineering technical publications. Courtesy of *R&T Transporter:* http://www.tfhrc.gov/trnsptr/sep03/index.htm#fhwa.

GIS Professional Certification Program Now Available

Candidates in a pilot program received the first-ever GIS Professional Certifications at the 41st annual Urban and Regional Information Systems Association Conference, held last month in Atlanta. Dr. William Huxhold of the University of Wisconsin–Milwaukee led the certification standards working group. Other topics at the conference included an overview of Australia's new Spatial Sciences Institute. Read more at directionsmag.com: http://www.directionsmag.com/article.php?article_id=438.

Tennessee DOT Shares Planning Lessons Learned

Transportation project planners need to expand public involvement and place greater emphasis on context-sensitive design, according to "Lessons Learned," a report commissioned by Tennessee DOT Commissioner Gerald Nicely. Nicely suspended work on 15 TDOT projects pending the results of this study, conducted by the University of Tennessee Center for Transportation Research and released in October. Link to TDOT press release: http://www.tdot.state.tn.us/information-office/2003pr/10-20-2003lessons.htm.

Design Speed vs. Operating Speed

Lane width has little affect on drivers' operating speed, while factors such as on-street parking and median type do show some influence, says a recent report from the TRB's National Cooperative Highway Research Program. The report examines the relationship between design speed and operating speed, and presents the basis for recent changes in speed definitions in AASHTO's "A Policy on Geometric Design of Highways and Streets" ("Green Book") and FHWA's *Manual on Uniform Traffic Control Devices.* Courtesy of the TRB E-Newsletter: http://gulliver.trb.org/news/blurb_detail.asp?id=1928.

Research Helps Ensure Bridge Design Software Accuracy

Bridge engineers rely on software to design bridges to new specifications, but variations in bridge types, geometric configurations, materials, and loadings make it difficult to independently validate the software's accuracy. Recent NCHRP research noted in the *TR NEWs* Research Pays Off series, provides a systematic method for comparing and evaluating bridge design and analysis software, a standardized report format for presenting and comparing results for a specific bridge design, and a method for formally reviewing specification changes. See http://trb.org/news/blurb_detail.asp?id=1998.

Construction and Materials Innovations

Iowa Shifts To High-Performance Concrete For Bridges

In the most recent issue of *HPC Bridge Views,* a bimonthly publication, an Iowa DOT official describes the process through which his agency shifted from standard concrete mix designs to high-performance designs. Standard mixes failed slump and air content tests, but HPC designs with furnace slag and water reducing admixtures performed well.
http://www.portcement.org/pdf_files/hpc-29sepoct03.pdf.

Concrete Distress Detection Study Posted Online

Recently posted on the Web site of the Iowa Center for Transportation Research and Education, this study, "Development of In-Situ Detection Methods for Material Related Distress (MRD) in Concrete Pavements," narrows nondestructive detection methods to two stress-wave propagation, infrared thermography, ground-penetrating radar and visual inspection. Investigators felt GPR most promising but in need of further development.
http://www.ctre.iastate.edu/reports/mrd.pdf.

ASR Got You Down? Get Primed On Latest Research

Georgia Tech professor Kimberly Kurtis and her graduate students have created a useful site on Alkali Silica Reaction: "The Cancer of Concrete." Text, images and tutorials describe current research and the promising directions Dr. Kurtis' group is taking.
http://www.ce.gatech.edu/~gtg906f/kkurtis/public_html/gwillis/index.htm

Asphalt Binder Selection Process Online

The North Central Superpave Center at Purdue University recently posted the certification method used by several states, including Wisconsin, for accepting asphalt binders. Specifications, a specs chart, and contacts can be viewed at
http://ce.ecn.purdue.edu/~spave/Round%20Robin/cert%20toc%202003.html.

New Bridge Girder Prestress Loss Estimation Guidelines Posted

Engineers have had to extrapolate high-strength concrete prestress loss estimates from procedures for regular-strength concrete – until now, as we learned from a recent TRB E-Newsletter. A newly posted NCHRP study, "Prestress Losses in Pretensioned High-Strength Concrete Bridge Girders," provides guidelines drawn directly from evaluations of high-stress concrete. See http://gulliver.trb.org/publications/nchrp/nchrp_rpt_496.pdf.

FRP Laminates Perform and Endure On New York Bridge

Published in the spring, a New York study – "In-Service Evaluation of a Concrete Bridge FRP Strengthening System" – found that after two years, FRP performed well. Load tests demonstrated fiber-reinforced polymer laminate-reinforced concrete beams showed less strain, and inspection and thermographic analysis showed the bond between the laminate and the concrete was still strong. http://www.dot.state.ny.us/tech_serv/trdb/files/sr139.pdf.

Software Helps Evaluate Pavement Smoothness

Turner-Fairbank Highway Research Center recently posted a brief on a pavement evaluation software package. ProVAL – Pavement Profile Viewer and Analyzer – imports and analyzes pavement profile data using various methods, including IRI, profilograph, rolling straightedge, power spectral density, profile index and more. ProVAL can help evaluate pavement smoothness right after construction for possible correction or payment adjustments.
http://www.tfhrc.gov/pavement/ltpp/reports/provalbrief/index.htm.

Operating/Optimizing the System

Attend a Work Zone Workshop From Your Desk

FHWA's Making Work Zones Work Better Workshops promote the use of innovative practices, technologies, and products that have the potential to improve work zone mobility and safety. Access the papers and presentations from the workshops, including those focused on integrating operations with planning, at http://www.ops.fhwa.dot.gov/wz/workshops/sheet4.htm.

Pick the Perfect Roadside Plant with New Web Site

Minnesota Department of Transportation's new PlantSelector Web site helps transportation professionals choose the most appropriate plants to use along roadsides based on user-entered landscape criteria. The site provides extensive data on more than 650 woody and herbaceous plants and up to 49 distinct fields of site and plant characteristics. Link to the MnDOT press release at http://www.dot.state.mn.us/newsrels/03/10/02plantselector.html and the PlantSelector site at http://plantselector.dot.state.mn.us/.

LED Signal Study Addresses Color Confusion

In response to a complaint from a color blind person about green LED traffic signals, the Minnesota Department of Transportation recently conducted a field test to help determine the most appropriate specifications for purchasing LED traffic signals. Although the test did confirm that some common LED green signals can be misperceived by people having red-green color blindness, the best solution for those with color blindness is not the best solution for those without it. Link to the report: http://www.dot.state.mn.us/trafficeng/research/data/ClrBlnd.pdf

Electronic Signs Encourage Drivers to Fall in Line

Maryland is among several states testing new electronic message signs for guiding traffic through construction zones where two lanes are squeezed into one. Called the Dynamic Late Lane Merge System, the system detects traffic volume and then displays messages to drivers about how best to merge. This technology is designed to discourage early lane changes that result in costly traffic congestion as well as dangerous, last-second forced lane merging. See the news release at: http://www.mdot.state.md.us/News/2003/October2003/lane_closure.htm

Scenic Route Success Story

The Rhode Island Department of Transportation has created its first "environmental corridor." The new, beautified route will serve as an alternative to commercial development, calm heavy traffic, reduce maintenance costs, and generally make people smile. Link to this AASHTO feature story at http://www.transportation.org/aashto/success.nsf/allpages/2003-21RhodeIsland.

TxDOT Offers Help for Rural Highway Sign Placement

Guided by research on the needs of rural highway sign crews, the Texas Transportation Institute and the Texas Department of Transportation recently developed the *Sign Crew Field Book* as a supplement to FHWA's *Manual on Uniform Traffic Control Devices.* The guide provides additional assistance with respect to sign placement, barrier reflectors, delineation standards and more. Link to the article in the *Texas Transportation Researcher:* http://tti.tamu.edu/researcher/v39n1/sign_placement.stm

Grumpy Greeting for UK Speeders

Some speedy drivers in the United Kingdom must now slow down or face electronic scowls from fed-up villagers. Residents in Baginton, near Coventry, joined with police to let drivers know what speed they're going by using electronic signs – a scowling face for speeders and smiley face for those within the speed limit. Link to icCoventry news story: http://iccoventry.icnetwork.co.uk/0100news/0100localnews/content_objectid=13496421_method=full_siteid=50003_headline=-Grumpy-greeting-for-speeders-name_page.html. Courtesy of the Transportation Communications Newsletter.

Safe Travel/Smart Travel

Real-Time Traffic Camera Images For First Responders

While VDOT has traffic cameras available for viewing over the agency's Web site, the on-line picture refreshes at a rate of 1.5 frames per second, and images are slightly behind real-time. The streaming video images now available to first responders refresh at 20 to 30 frames per second, providing a real-time image of roadway conditions and emergencies in Northern Virginia. From ITS America News: http://www.itsa.org/ITSNEWS.NSF/4e0650bef6193b3e852562350056a3a7/c9b6c8ce86f728e585256dc000465fa0?OpenDocument.

Real-Time, Predictive Traffic Information For Travelers

Real-time, advisory information on traffic conditions is of less use to the public at the pre-trip planning stage since traffic conditions change over time. This study presents the full-scale implementation of a short-term traffic prediction model that was developed by the University of Central Florida's Transportation Systems Institute to assist I-4 travelers with trip-making decisions along the 40-mile I-4 corridor in Orlando. Link courtesy of the Transportation Communications Newsletter: http://www.dot.state.fl.us/research-center/Completed_Proj/Summary_TE/FDOT_BC355_03_rpt.pdf

IHSDM Download Available

The Interactive Highway Safety Design Model (IHSDM) is road safety evaluation software that marshals available knowledge about safety into a more useful form for highway planners and designers. Staff from WisDOT, other state DOTs and FHWA recently participated in IHSDM pilot training in Madison, WI. The 2003 release of IHSDM for two-lane rural highways can be downloaded for testing and evaluation at http://www.tfhrc.gov/safety/ihsdm/ihsdm.htm.

Version 5.0 Available: National ITS Architecture

Version 5.0 of the National ITS Architecture includes a host of new features that enhance the architecture definition and make it easier to access information, including: emissions management modifications, added 5-1-1 support to the architecture, transit related updates, and enhanced logical architecture hypertext. Link courtesy of the Transportation Communications Newsletter: http://itsarch.iteris.com/itsarch/html/whatsnew/whatsnew.htm

Merge Ahead: ITS and Security

Increasingly, state and local governments are tapping ITS for crisis management, and allowing police and other first responders to draw information from transportation systems. Link to article in *Washington Technology:* http://www.washingtontechnology.com/news/18_14/editors-notes/21889-1.html. Courtesy of the Transportation Communications Newsletter.

Better Than Pavement Loops?

Colorado Springs needed to find a cost effective solution to loop failures, reduce maintenance costs, and keep up with rapid lane configuration changes caused by growth. Video detection has improved service to citizens, reduced delay caused by broken loops, and reduced signal maintenance costs. Link to article in *Conveyances:* http://www.cowyite.org/sept03.pdf, scroll down to page 3. Courtesy of the Transportation Communications Newsletter.

ITS 'BENEFIT OF THE MONTH' WEB SITE

Too often ITS professionals are caught unprepared when asked to cite specific examples of the return on investment from ITS solutions. Not only does the ITS Joint Program Office provide this valuable monthly glance at highlights, but also a much more comprehensive ITS Benefits Database. From ITS America News: http://www.benefitcost.its.dot.gov/.